

<110> Betenbaugh et al.

<120> Engineering Intracellular Sialylation Pathways

<130> PF509P2

<140> Unassigned

<141> Herewith

<150> 60/227,579

<151> 2000-08-25

<150> 09/516,793

<151> 2000-03-01

<150> 60/169,624

<151> 1999-12-08

<150> 60/122,582

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<170> PatentIn Ver. 2.1

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Thr Asp Leu Leu Asp Phe Gly Gln Cys Val Asp Gln Asn Arg Gln Gln				
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Ser Thr Leu Leu Ser Asn				
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 Ser Glu Val Ser Lys Asp Ser Ser Thr Ser Leu Asp Ala Ile Ile Glu  
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Lys Ala Leu Glu Arg Pro Tyr Thr Ser Lys His Ser Trp Gly Lys Thr			
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tac ggg gag cac aaa cga cat ctg gag ttc agc cat gac cag tac agg			288
Tyr Gly Glu His Lys Arg His Leu Glu Phe Ser His Asp Gln Tyr Arg			
	85	90	95
gag ctg cag agg tac gcc gag gag gtt ggg atc ttc ttc act gcc tct			336
Glu Leu Gln Arg Tyr Ala Glu Glu Val Gly Ile Phe Phe Thr Ala Ser			
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ggc atg gat gag atg gca gtt gaa ttc ctg cat gaa ctg aat gtt cca			384
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	115	120	125
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Phe Phe Lys Val Gly Ser Gly Asp Thr Asn Asn Phe Pro Tyr Leu Glu			
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	180	185	190
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	195	200	205
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	225	230	235
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Leu Asp Lys Thr Trp Lys Gly Ser Asp His Ser Ala Ser Leu Glu Pro			
	245	250	255
gga gaa ctg gcc gag ctg gtg cgg tca gtg cgt ctt gtg gag cgt gcc			816
Gly Glu Leu Ala Glu Leu Val Arg Ser Val Arg Leu Val Glu Arg Ala			
	260	265	270



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 Tyr Gly Glu His Lys Arg His Leu Glu Phe Ser His Asp Gln Tyr Arg  
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 Lys Thr Ala Lys Lys Gly Arg Pro Met Val Ile Ser Ser Gly Met Gln  
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 Asp Ile Pro Ile Gly Tyr Ser Gly His Glu Thr Gly Ile Ala Ile Ser

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Gly Glu Leu Ala Glu Leu Val Arg Ser Val Arg Leu Val Glu Arg Ala
      260              265              270
Leu Gly Ser Pro Thr Lys Gln Leu Leu Pro Cys Glu Met Ala Cys Asn
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Glu Lys Leu Gly Lys Ser Val Val Ala Lys Val Lys Ile Pro Glu Gly
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Thr Ile Leu Thr Met Asp Met Leu Thr Val Lys Val Gly Glu Pro Lys
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Ala Tyr Pro Pro Glu Asp Ile Phe Asn Leu Val Gly Lys Lys Val Leu
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      20              25              30

gtt aat gca gta aaa ttc caa aca ttt aaa gct gat aaa tta att tca   144
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gaa tct cag tta gaa atg aca aaa aag ctt gaa atg aag tat gac gat   240
Glu Ser Gln Leu Glu Met Thr Lys Lys Leu Glu Met Lys Tyr Asp Asp
      65              70              75              80

tat ctc cat cta atg gaa tat gca gtc agt tta aat tta gat gtt ttt   288
Tyr Leu His Leu Met Glu Tyr Ala Val Ser Leu Asn Leu Asp Val Phe
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tct acc cct ttt gac gaa gac tct att gat ttt tta gca tct ttg aaa   336
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ctt gaa aaa ata gcc aag ctt ccg atc cct gat aag aaa ata atc ata			432
Leu Glu Lys Ile Ala Lys Leu Pro Ile Pro Asp Lys Lys Ile Ile Ile			
130	135	140	
tca aca gga atg gct act att gat gag ata aaa cag tct gtt tct att			480
Ser Thr Gly Met Ala Thr Ile Asp Glu Ile Lys Gln Ser Val Ser Ile			
145	150	155	160
ttt ata aat aat aaa gtt ccg gtt ggt aat att aca ata tta cat tgc			528
Phe Ile Asn Asn Lys Val Pro Val Gly Asn Ile Thr Ile Leu His Cys			
165	170	175	
aat act gaa tat cca acg ccc ttt gag gat gta aac ctt aat gct att			576
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180	185	190	
aat gat ttg aaa aaa cac ttc cct aag aat aac ata ggc ttc tct gat			624
Asn Asp Leu Lys Lys His Phe Pro Lys Asn Asn Ile Gly Phe Ser Asp			
195	200	205	
cat tct agc ggg ttt tat gca gct att gcg gcg gtg cct tat gga ata			672
His Ser Ser Gly Phe Tyr Ala Ala Ile Ala Ala Val Pro Tyr Gly Ile			
210	215	220	
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gat cat ttg gcc tca ata gaa cct gat gaa ctg aaa cat ctt tgt att			768
Asp His Leu Ala Ser Ile Glu Pro Asp Glu Leu Lys His Leu Cys Ile			
245	250	255	
ggg gtc agg tgt gtt gaa aaa tct tta ggt tca aat agt aaa gtg gtt			816
Gly Val Arg Cys Val Glu Lys Ser Leu Gly Ser Asn Ser Lys Val Val			
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Thr Ala Ser Glu Arg Lys Asn Lys Ile Val Ala Arg Lys Ser Ile Ile			
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290	295	300	
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Thr Thr Lys Arg Pro Gly Asn Gly Ile Ser Pro Met Glu Trp Tyr Asn			
305	310	315	320
tta ttg ggt aaa att gca gag caa gac ttt att cca gat gaa tta ata			1008
Leu Leu Gly Lys Ile Ala Glu Gln Asp Phe Ile Pro Asp Glu Leu Ile			
325	330	335	
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Ile His Ser Glu Phe Lys Asn Gln Gly Glu  
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<211> 346

<212> PRT

<213> Escherichia coli

<400> 8

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 Val Asn Ala Val Lys Phe Gln Thr Phe Lys Ala Asp Lys Leu Ile Ser  
 35 40 45  
 Ala Ile Ala Pro Lys Ala Glu Tyr Gln Ile Lys Asn Thr Gly Glu Leu  
 50 55 60  
 Glu Ser Gln Leu Glu Met Thr Lys Lys Leu Glu Met Lys Tyr Asp Asp  
 65 70 75 80  
 Tyr Leu His Leu Met Glu Tyr Ala Val Ser Leu Asn Leu Asp Val Phe  
 85 90 95  
 Ser Thr Pro Phe Asp Glu Asp Ser Ile Asp Phe Leu Ala Ser Leu Lys  
 100 105 110  
 Gln Lys Ile Trp Lys Ile Pro Ser Gly Glu Leu Leu Asn Leu Pro Tyr  
 115 120 125  
 Leu Glu Lys Ile Ala Lys Leu Pro Ile Pro Asp Lys Lys Ile Ile Ile  
 130 135 140  
 Ser Thr Gly Met Ala Thr Ile Asp Glu Ile Lys Gln Ser Val Ser Ile  
 145 150 155 160  
 Phe Ile Asn Asn Lys Val Pro Val Gly Asn Ile Thr Ile Leu His Cys  
 165 170 175  
 Asn Thr Glu Tyr Pro Thr Pro Phe Glu Asp Val Asn Leu Asn Ala Ile  
 180 185 190  
 Asn Asp Leu Lys Lys His Phe Pro Lys Asn Asn Ile Gly Phe Ser Asp  
 195 200 205  
 His Ser Ser Gly Phe Tyr Ala Ala Ile Ala Ala Val Pro Tyr Gly Ile  
 210 215 220  
 Thr Phe Ile Glu Lys His Phe Thr Leu Asp Lys Ser Met Ser Gly Pro  
 225 230 235 240  
 Asp His Leu Ala Ser Ile Glu Pro Asp Glu Leu Lys His Leu Cys Ile  
 245 250 255  
 Gly Val Arg Cys Val Glu Lys Ser Leu Gly Ser Asn Ser Lys Val Val  
 260 265 270  
 Thr Ala Ser Glu Arg Lys Asn Lys Ile Val Ala Arg Lys Ser Ile Ile  
 275 280 285  
 Ala Lys Thr Glu Ile Lys Lys Gly Glu Val Phe Ser Glu Lys Asn Ile  
 290 295 300  
 Thr Thr Lys Arg Pro Gly Asn Gly Ile Ser Pro Met Glu Trp Tyr Asn  
 305 310 315 320  
 Leu Leu Gly Lys Ile Ala Glu Gln Asp Phe Ile Pro Asp Glu Leu Ile  
 325 330 335  
 Ile His Ser Glu Phe Lys Asn Gln Gly Glu  
 340 345